

REMARKS

Claims 1-10 are presented for examination.

Objections to the Specification

The specification has been objected to for not containing an abstract. Applicants have amended the specification to include the abstract as required by 37 CFR 1.72(b).

Objections to claims

Claim 4 and 9 are objected for containing certain informalities. Claims 4 and 9 have been amended to remove informalities.

Rejections under 35 USC §(102)(e)

Claims 1-4 and 6-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Patent No. 5894334 to Strolle et al. Applicants respectfully traverse these rejections.

To anticipate a claim, the reference must teach each and every limitation of the claim (*see* M.P.E.P. §2131).

As to claim 1, Strolle et al. do not teach each and every limitation of claim 1. First, Strolle et al. do not disclose a narrowband filter as recited in claim 1. In the cited sections, Strolle et al. discloses two mirror image filters 20 and 22 around Nyquist frequency. According to Strolle et al., “[e]ach filter exhibits real and imaginary functions so that output signals from these filters contain real and imaginary components.” (Col. 3, lines 62-66). Further, because Strolle et al. filters real and imaginary components separately, it requires conjugation by a conjugation unit 25 (*see* figure 1). Therefore, Strolle et al. do not disclose a narrow band pass filter adapted to receive a baseband VSB signal having a positive-frequency signal edge and provide a portion of the positive-frequency signal edge as recited in claim 1.

Second, Stolle et al. do not disclose a non-linear transformer as recited in claim 1. In the cited sections, Stolle et al. discloses a conjugation unit 25, a mixer 26 and a phase detector 28. Neither one of the cited elements have been described by Stolle et al. as non-linear transformer. If the combination of cited elements is considered as a non-linear transformer even then the combination is not adapted to receive a signal portion from the narrow band-pass filter as recited in claim 1. Even the Examiner has stated that “the signal portion (output signal from filter 22 is conjugated and then multiplied by the output signal from filter 20; col. 4, lines 58-67) and to provide a timing-retrievable signal.” (Page 4 of the Office Action, emphasis added). Thus, the combination of elements cited by the Examiner require further processing because the conjugation unit 25 receives only the imaginary portion of the signal from the lower bandedge filter 22. Therefore, Stolle et al. does not disclose a non-linear transformer adapted to receive said signal portion and provide a timing-retrievable signal adapted for retrieval of timing information therefrom as recited in claim 1. Accordingly, Stolle et al. does not teach each and every limitation of claim 1 as is required to anticipate a claim under 35 U.S.C. §102(e). Therefore, claim 1 is patentably distinguishable from Stolle et al.

Claim 2 depends from claim 1 and is patentably distinguishable from Stolle et al. for at least the same reasons as claim 1. Further, the Examiner has cited a loop filter 38 of Stolle et al. as the loop filter recited in claim 2. Applicants respectfully disagree. According to Stolle et al., the purpose of the loop filter 38 “is to drive every other sample of the imaginary component to zero.” (Col. 5, lines 43-49). In contrast, claim 2 recites a loop filter adapted to receive a timing-retrievable signal and average the timing-retrievable signal to provide a timing correction signal. Accordingly, Stolle et al. does not teach every limitation of claim 2 as is required to anticipate a claim under 35 U.S.C. §102(e) and claim 2 is further patentably distinguishable from Stolle et al.

Claims 3-4 depend from claim 1 and are patentably distinguishable from Stolle et al. for at least the same reasons as claim 1.

Claims 6-9 have been rejected in the manner of claims 1-4. Accordingly, claims 6-9 are patentably distinguishable from Stolle et al. for at least the same reasons as claims 1-4.

Rejections under 35 USC §(103(a))

Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strolle et al. (US 5894334) in view of Gatherer (US 5802461). Applicants respectfully traverse these rejections.

As stated above, claim 5 depends from claim 1, which has been distinguished from Strolle et al. for failing to disclose all limitations of claim 1. Therefore, the combination of Strolle et al. and Gatherer cannot render claim 5 obvious.

Further, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation in the references to combine reference teachings; Second, there must be a reasonable expectation of success; and finally, the combination of prior art must teach or suggest all the claim limitations. See M.P.E.P. § 2142.

1. The cited references do not suggest or provide motivation to combine their teachings.

Strolle et al. describes a carrier recovery system for Vestigial Sideband (VSB) signal using a pair of upper and lower band edge filters, mirror imaged around the upper and lower band edges of the VSB signal for producing suppressed sub-carrier output signal (*see abstract*). Strolle et al. uses conjugation of lower band signal output of lower band edge filter 22 to flip the spectrum of the filter 22 (*see col. 4, lines 57-65*). In contrast, Gatherer describes a method of recovering timing information from a VSB signal by filtering the edge signals and multiplying the filtered signals “without taking the complex conjugate of either signal, as in band edge component maximization (BECM).” (*See abstract; col. 2, lines 10-13, and 24-26, emphasis added; also see figure 1 and corresponding description*). Further, Gatherer requires “shifting the spectrum of the signal right and left so that each edge of the spectrum of at the origin, and then low pass filtering.” (Col. 3, lines 11-14). In contrast, Strolle et al. does not require shifting the signal spectrum before filtering. Thus, Strolle et al., and Gatherer describe two completely different methods of extracting carrier signals. In fact, they teach away from each other and therefore, they do not suggest or provide motivation to combine their disclosures.

2. There is no reasonable expectation of success in combining the cited references.

As described above, Gatherer requires shifting the spectrum of the signal before low-pass filtering the signal. In contrast, Strolle et al., teaches filtering the signal without shifting the spectrum. Further, Strolle et al., requires using either positive or negative spectral components but not both (see col. 4, lines 2-5). In contrast, Gatherer does not describe this limitation. Accordingly, Strolle et al. and Gatherer teach away from each other and there cannot be a reasonable expectation of success in combining the cited references.

3. The combination of Strolle et al. and Gatherer do not teach all the claim limitations.

The Examiner has cited the band edge component maximization $g(t) = \lambda(t)^* \lambda(t)$ of Gatherer where the complex conjugate of $\lambda(t)$ is taken before the terms are multiplied. Applicants would like to respectfully point to the Examiner that the signal $\lambda(t)$ is the output of the low-pass filter, which includes a rotated data vector and the modulated phase shape, which is why the maximization of the output $g(t)$ is produced as shown in the equation 6 (see col. 3, lines 11-51). In contrast, in Strolle et al. when the conjugation of the output of the lower band edge filter 22 is multiplied by the output of the upper band edge filter 20, it produces an AM signal that has carrier frequency component f_c removed (see col. 5, lines 1-3). Thus, neither Strolle et al. nor Gatherer suggest or teach a non-linear transformer adapted to square the signal thereby providing a complex signal having a real and an imaginary component and provide said imaginary component as said timing-retrievable signal. Accordingly, the combination of cited references do not teach all the limitations of claim 5 and claim 5 is further distinguishable from the combination of Strolle et al. and Gatherer.

Claim 10 has been rejected in the manner of claim 5. Accordingly, claim 10 is patentably distinguishable from the combination of the cited references for at least the same reasons as claim 5.

Applicant believes this application and the claims herein to be in a condition for allowance.
Should the Examiner have further inquiry concerning these matters, please contact the below
named attorney for Applicant.

Respectfully submitted,



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